First record of the freshwater bream, *Abramis brama* in the river Mala Neretva, Adriatic drainage system of Croatia

by

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RÉSUMÉ. - Premier signalement de la brème commune, *Abramis brama*, dans la rivière Mala Neretva, système de drainage adriatique de Croatie.

Le 17 avril 2010, un spécimen de *Abramis brama* a été capturé au trémail dans la rivière Mala Neretva (système de drainage adriatique de Croatie). C'est le premier signalement de la brème commune dans cette rivière, et par conséquent dans le système hydrographique drainé vers l'Adriatique.

Key words. - Cyprinidae - *Abramis brama* - Adriatic drainage system - Mala Neretva River - First record.

The freshwater bream, *Abramis brama* (Linnaeus, 1758), is a cyprinid fish native to most of Europe and western Asia. It inhabits most European drainages from Adour (France) to Pechora (White Sea basin); Aegean Sea basin, in Lake Volvi and Struma and Maritza drainages (Kottelat and Freyhof, 2007). However, the freshwater bream is not native to Iberian Peninsula, Adriatic basin, Italy, Scotland, and Scandinavia north of Bergen (Norway) and 67°N (Finland). It is locally introduced in Ireland, Spain, north-eastern Italy, from Marmara basin (Turkey) and eastward to Aral basin, in Lake Baikal and upper Ob and Yenisei drainages (Kottelat and Freyhof, 2007). The present contribution describes the first record of the freshwater bream in the Mala Neretva River and consequently also the first record for the Adriatic drainage system as a whole.

On 17 April 2010, one specimen (male, gonad weight 12.2 g) of freshwater bream (total length TL = 43.8 cm, weight W = 1046.8 g) (Fig. 1) was captured by trammel net (mesh size 18/20 mm) near the settlement Mihalj (Fig. 2) at a depth of 1 m in a muddy bottom habitat. The specimen was deposited in the ichthyological collection of the University of Dubrovnik, Department for Aquaculture (catalogue number UNIDU 23). The specimen was identified according to Vuković (1977).

Description of Mala Neretva River

The Mala Neretva is a 15 km river section close to the Neretva River delta. Due to reclamation works in the last 50-years, it is now disconnected upstream from the main course of Neretva River by a dam and separated downstream from the sea by another dam which prevents inflow of sea water. The artificial regulation of flow create specific conditions and today Mala Neretva River is under a slow flow rate during winter and almost without flow during summer. It is between 0.5 and 1.5 m deep and 10 to 25 m width. Banks are covered with reed-weed vegetation and bottom is covered with algae. The temperature range is between 7-8°C in winter and 25-28°C during summer season. The salinity is always bellow 1 psu, despite adjacent marine waters. This creates a suitable habitat for most of the cyprinid species and freshwater bream as well.

Description of Mala Neretva River specimen

Morphometric and meristic characters are presented in table I. All counts, measurements and descriptions are comparable with those of Vuković (1977) and Kottelat and Freyhof (2007).

Specimen has high-backed and laterally flattened and compressed body. Anal fin base is twice as long as the dorsal fin. Mouth is sub-inferior, and extended as a tube. The fish has a silvery gray colour with some bronze patches. The bases of the paired fins are grey. Eyes are small and about 2/3 of snout length. Scales in lateral line are 55, while pharyngeal teeth are 5-5, in only one rank. Specimen (male) has nuptial tubercles on head and body.

Consequences

No scientific publication has previously reported *Abramis*

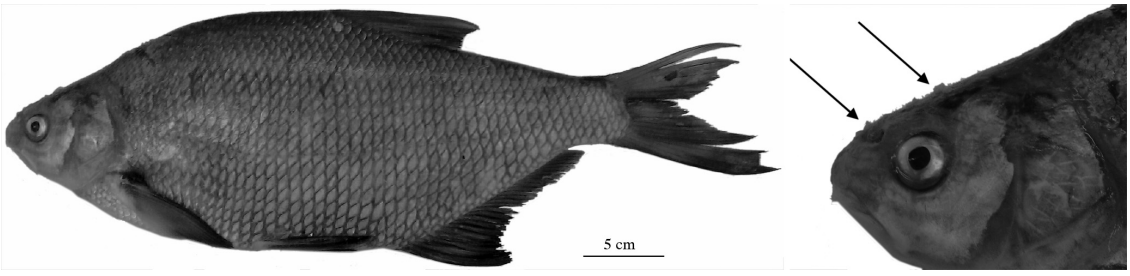

Figure 1. - *Abramis brama* (43.8 cm TL) from Mala Neretva River, Croatia. [♂, ➞ nuptial tubercles on the head].

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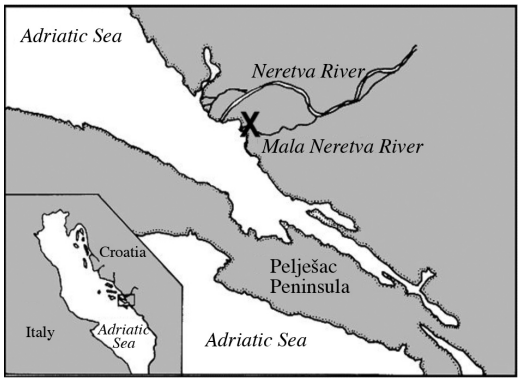

Figure 2. - Location of the River Mala Neretva.

Parameters	
Total length	438
Standard length	345
Predorsal length	208
Preanal length	234
Prepelvic length	146
Prepectoral length	92
Max. body depth	146
Head length	88
Eye diameter	16
Preorbital length	28
Dorsal fin	III, 10
Anal fin rays	III, 26
Pectoral fin rays	14
Ventral fin rays	8
Caudal fin rays	19
Lateral line scales	55

Table I. - Morphometric measurements (in mm) and meristic counts of *Abramis brama* from the Mala Neretva River.

brama in the Neretva River watershed, nor in any other river of the Adriatic drainage system (Vuković, 1977; Kosorić *et al*., 1983). Even though some fishermen have signalled the species in some parts of Neretva River delta during 2009 (Zovko, pers. comm.; Dugandžić, pers. comm.), suggesting there were an established population of the species, these reports needed to be confirmed on a scientific basis.

Since *A. brama* has been recently introduced to the Iberian Peninsula in Catalonia (Benejam *et al*., 2005), this confirmation extends once again the distribution area of the species in the Mediterranean region were endemic cyprinids are numerous.

Like all cyprinids, freshwater bream can easily hybridize with other relative species, especially with *Rutilus rutilus* (Cowx, 1983) and *Scardinius erythrophthalmus* (Economidis and Wheeler, 1989). The coexistence of introduced freshwater bream with native *Rutilus basak* (Heckel, 1843) and *Scardinius plotizza* Heckel & Kner, 1858, within the same habitats in Mala Neretva River and the temporal overlap of spawning seasons exposes the native species to future hybridizations in the Neretva River complex estuary.

Freshwater bream feeds on insects, particularly chironomids, small crustaceans, molluscs and plants. Larger specimens may feed on small fish, while juveniles feed on zooplankton (Billard, 1997). It is able to shift to particle feeding or even filter feeding at high zooplankton abundance. This highly diversified regime gives the species a strong advantage in the competition with other species that have the same or a similar feeding ecology. As already reported for the pumpkinseed *Lepomis gibbosus* in the area of Neretva River (Glamuzina and Conides, 2000) and *Gymnocephalus cernuus* in the area of Hutovo Blato (Dulčić *et al*., 2005), there is a high possibility that freshwater bream enters the waters of Neretva River and Hutovo Blato wetland and affects their ichthyofauna. The occurrence of exotic freshwater fishes in Neretva River delta should be more controlled by fish management authorities. The possible sources of introduction are: (1) stock enhancement in Hutovo Blato wetlands (Neretva River, Bosnia-Herzegovina) executed yearly for carp but not sufficiently controlled, (2) entering fishes from adjacent Trebisnjica River watershed (artificial lakes and channels of hydropower system) through underground connections. These waters are usually stocked with carp, but due to insufficient control, other species also appear, such as pumpkinseed or ruffe. From the sites of stocking fish easily swim to nearby water bodies in Croatian part of Neretva River Delta, where they have established populations.

The Neretva River delta is shared between the Republic of Croatia and the Republic of Bosnia-Herzegovina. Prevention measures should be taken by the administration in both states to avoid the spreading of new exotic species to other river basins and wetlands since the eradication is practically impossible in large freshwater ecosystems.

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